RENEWAL OF PERMITS TO OPERATE AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT OEPA ID NOS. 1431110128 T028, T029, T030, T031, T032, T033 AND T034

10/07/93

C:RP:93-0164 FERMCO/OEPA 36 PERMIT AP



ernald Environmento

estoration Management Corporation P.O. Box 3987O4 Cincinnati, Ohio 45239-87O4 (513) 738-62OO

October 7, 1993

U. S. Department of Energy Fernald Environmental Management Project Letter No. C:RP:93-0164

Mr. Peter Sturdevant Compliance Specialist Hamilton County Department of Environmental Services Air Quality Management Division 1632 Central Parkway Cincinnati, Ohio 45210

Dear Mr. Sturdevant:

RENEWAL OF PERMITS TO OPERATE AT THE FERNALD ENVIRONMENTAL MANAGEMENT PROJECT OEPA ID. NOS. 1431110128 TO28, TO29, TO30, TO31, TO32, TO33, AND TO34

Enclosed please find the renewal applications for seven FEMP storage tanks for which the Permits to Operate are scheduled to expire in December 1993. A check for \$105.00 is enclosed to cover the application fees.

Please contact Kip Klee of my staff at 738-8640 if you have any questions about these applications.

Sincerely,

Kenneth L. Alkema

Vice President

Regulatory Programs

KLA:KOK:mhv Attachments

cc:

S. M. Beckman, FERMCO - w/o attachments R. W. Bischoff, FERMCO - w/o attachments Robert Mendelsohn, DOE Contract Specialist

P. B. Spotts, FERMCO - w/o attachments

W.\_J.\_Quaider, DOE- FN

AR Coordinator ?

PR Files (PTOs TO28-TO34) - w/o attachments

File Record Storage Copy 108.6

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

D.O.E. Facili	Fernald Envir ity Name		lanagement Project	Mr. Stephen Person to C	
7400 W Facili	Villey Road ity Address			Post Office Mailing Add	
<u>Fernal</u> City		on unty	<u>45030</u> Zip	<u>Cincinnati</u> City	OH 45239-8705 State Zip
Teleph		<u>513/ 738-</u> Area	6502 Number	Telephone	513/ 738-6502
(Appli	cation no., if	#143111012 this is a		ication)	4953 Std. Ind. Class. Code
1.	Complete and a air contaminan	ttach any t source.	of the follow In addition,	ing appendices a compliance	s most appropriate to the time schedule form is to the following:
	Appendix A, Appendix B, Appendix C, Appendix D,	Fuel-Burn Incinerat Surface C	or	<del></del> ,.	L, Solvent Metal Cleaning M, Fugitive Dust Emission Sources
	XX_Appendix E,Appendix H,Appendix J,	Storage T Gasoline Facility	ank Dispensing		Specify Appendix No. N, Rubber Tire Manufacturing O, Dry Cleaning
	Appendix K,	Gasoline Terminal Surface C	Plant or	Appendix Other App	Facility P, Landfills
2.	Description of	Source (sa	ame as used on	appendix):	UNH Storage Tank F2E-10
3.	Your identifica Plant 2		Source (same a rage Tank F2E-		
1	Administrative contaminant so	Code, her urce(s) de	eby apply for scribed hereir	a Permit to C n. As require	O2(B) of the Ohio Operate the air ed, the following application (describe all
	(1) Appendix E- (2) Emissions E			Authorized S Kenneth L. A Vice Preside Title	
				Date Date	f93

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1  $\,$  EPA-3161  $\,$ 

Premise No.		/	_/	/	
Source No	/		_		_
Application	No.		_/		
				-	

DOE - FEMP (Facility Name)

# APPENDIX E-2

### INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

	STATE OF THE STATE				
1.	Tank identification: Name or number <u>UNH Storage Tank F2E-10</u> Date Installed <u>1952</u> (FEMP Id. # 2-017) (month/year)				
2.	Tank capacity: 2,500 gallons				
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify				
4.	Tank dimensions: Diameter <u>6 ft.</u> Height <u>12 ft.</u> Length <u></u> Width <u></u>				
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel				
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ ] Other, specify				
7.	Location of tank: [ ] Outdoors [X] Indoors [ ] Underground				
8.	Type of filling: [X] Splash [] Submerged [] Other, specify				
	If this tank is located outdoors and above ground, provide the paint color of the tank.  [ ] Aluminum (specular) [ ] Light gray [ ] White [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify				
	Condition of paint: [] Good [] Poor				
10.	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.				
N/A	a) Type of vapor control system Make or model Date installed (month and year)				
	b) Date tank was equipped with or vented to vapor control system (month & year)				
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:  (Attach calculations and test data to support response, unless previously submitted.)				

DOE - FEMP (Facility Name) F2E-10 (2-017) (tank identification)

11. N/A	Cor	mplete the table below for any pressure or vacuum relief vent valve.
•	Ty	Pressure Vacuum If pressure relief is discharged to pe of Vent Valve Setting Setting vapor control, identify the vapor contr
	_	
12.	Ope sto	erational Data (complete (a) through (g) of this item for all materials stored or to ored. Attach additional sheets if necessary.)
	a)	Material <u>Uranyl Nitrate</u> Trade Name <u>UNH</u> Density: <u>9.0</u> lbs/gal or <u></u> API Producer <u>FERMCO</u>
	b)	Temperature of stored material: Average <u>AMB</u> °F and Maximum <u>AMB</u> ° F (If temperature is approximately outdoor ambient temperature, write "AMB".)
	c)	Vapor pressure of stored material (Complete i, ii, iii of this item. If vapor pressure not known, write "unknown"):
		i.) Actual vapor pressure: $0.23$ psia at average storage temperatur $0.29$ psia at maximum storage temperatur
		ii.) Reid vapor pressure: "Average <u>unkn</u> psi and minimum-maximum <u>unkn</u> p
		iii.) If material stored is a gas or liquified gas, provide the pressure at which is stored: <u>N/A</u> psi gage at <u>N/A</u> °F
N/A	d)	Type of liquid organic material (If the material is an organic liquid <u>other</u> than a gasoline, fuel oil, kerosene, crude oil, lubricant or other petroleum liquid, answe the question below.)
		Is it a photochemically reactive material? [ ] Yes [ ] No
	e)	Type of waste material (If the material is a waste, answer the question below.)
		Is it a hazardous waste? [ ] yes [X] No If yes, identify type (EPA hazardous waste number)
	f)	Indicate the year (or 12-month period) for item (g): $1-1-94$ to $12-31-94$
	g)	Annual throughput of material: 100,000 gallons.
Comple	eted	by Kip Klee Date 09-16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6 x  $10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

	****		
Tank Characteristics Identification Identification No.: State:	T028 Ohio	City: Company:	Dayton DOE-FEMP
Input Parameters Type of Tank:	Vertical Fix	red Roof	
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	12 12 40	Diameter (ft): Volume (gallons): Net Throughput (gal/yr):	6 2538 : 100000
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Height (ft): Dome Radius (ft):	0.000
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Aluminum/Spe Aluminum/Spe		Good Good
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00

```
---- Storage Tank Contents Temperature Data ----
 Daily Average Ambient Temperature (Degrees Fahrenheit) =
                                                                  51.90
 Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                  42.30
 Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                  61.50
 Daily Ambient Temperature Range =
                                                                  19.20
 Solar Insolation Factor =
                                                                1160.00
 Alpha (Shell) =
                                                                   0.39
                                                                   0.39
 Alpha (Roof) =
 Liquid Bulk Temperature (Degrees Fahrenheit) =
                                                                  53.24
Average Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                  56.22
 Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                  62.84
 Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) = 49.60
                                                                  26.49
 Daily Vapor Temperature Range =
 --- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                               0.227238
Minimum Vapor Pressure of total mixture =
                                               0.175816
Maximum Vapor Pressure of total mixture =
                                              0.287205
_Vapor Molecular Weight of Mixture =
                                            18.000000
Vapor pressure range =
                                               0.111389
--- Storage Tank Standing Loss Information (AP-42) ----
Root Outage =
                                     0.00
Vapor Space Outage =
                                      0.00
Vapor Space Volume =
                                      0.00
Vapor Density =
                                   0.0007
Breather Vent Range =
                                 0.000000
Vapor Space Expansion Factor = 0.044914
Vented Vapor Saturation Factor = 1.000000
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                100000
Liquid Volume (cubic feet) =
                                   339
Turnovers =
                                    39
Turnover Factor =
                                0.9282
Working Loss Product Factor =
                                 1.00
Total Working Losses =
                                  9.04
--- Storage Tank Total Losses (AP-42) ----
Total losses = 9.04
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Maximum Emissions: 5.42 E-08 lb U/year x 5 = 2.71 E-07 lb U/year

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

479 8

D.O.EFernald En Facility Name		<u>lanagement</u> Project	Mr. Stephen Mr. Person to Co	
•	<u></u>	10,1600		
7400 Willey Road	<del></del>	<del></del>	Post Office B	
Facility Address			Mailing Addr	ess
	ilton	45030	Cincinnati	OH 45239-8705
City	County	Zip	City	State Zip
	<u>513/</u> 738-	6502		513/ 738-6502
Telephone	Area	Number	Telephone	
	#143111012	8-T029		4953
(Application no.,	if this is a	renewal appl	ication)	Std. Ind. Class. Code
air contamii	nant source.	In addition,	ing appendices a compliance s appropriate	most appropriate to the time schedule form is to the following:
Appendix Appendix Appendix	C, Incinerat D, Surface C Printing	oating or Operation		L, Solvent Metal Cleaning M, Fugitive Dust Emission Sources
Appendix	E, Storage T H, Gasoline Facility J, Loading R	Dispensing ack at Bulk	<del></del> ··	Specify Appendix No. N, Rubber Tire Manufacturing O, Dry Cleaning
Appendix	Gasoline Terminal K, Surface C Line or P		Other Appe	Facility P, Landfills endix Time Schedule
2. Description	of Source (s	ame as used or	n appendix): <u>U</u>	NH Storage Tank F2E-6
			as used on appe -6, FEMP Id.#	
Administrati contaminant	ive Code, her source(s) de locuments are	eby apply for scribed herei	a Permit to Op n. As required	2(B) of the Ohio perate the air d, the following pplication (describe all
(1) Appendix (2) Emission			Authorized St Kenneth L. Al Vice Presider Title	
			Date	

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

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D	M = '	,	,

Premise No.	///
Source No	
Application	No/

DOE	- FEMP
	ity Name)

# APPENDIX E-2

### INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1.	Tank identification: Name or number <u>UNH Storage Tank F2E-6</u> Date Installed <u>1952</u> (FEMP Id. # 2-026) (month/year					
2.	Tank capacity: 25,265 gallons					
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify					
4.	Tank dimensions: Diameter 16.5 ft. Height 16 ft. Length Width					
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel					
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] rressure tank [ ] Other, specify					
7.	Location of tank: [X] Outdoors [] Indoors [] Underground					
8.	Type of filling: [X] Splash [] Submerged [] Other, specify					
9. N/A	If this tank is located outdoors and above ground, provide the paint color of the tank.  Tank is stainless steel, not painted  [ ] Aluminum (specular) [ ] Light gray [ ] White  [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify					
	Condition of paint: [ ] Good [ ] Poor					
10.	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.					
N/A	a) Type of vapor control system Manufacturer Make or model Date installed (month and year)					
	b) Date tank was equipped with or vented to vapor control system (month & year)					
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:  (Attach calculations and test data to support response, unless previously submitted.					

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DOE - ALEMPA	<i>™</i>
"Pacility"N	ame)
F2E-6	(2-026)
(tank ident	ification)

í

Ά.	<u>Typ</u>	e of Vent Valve	Pressure <u>Setting</u>	Vacuum Setting			f is discharged to a fy the vapor control
		· · · · · · · · · · · · · · · · · · ·				7.4.	
		rational Data (com red. Attach addit				all mater	rials stored or to be
	a)	Material <u>Urany</u> Density: <u>9.0</u>	<u>l Nitrate</u> _ lbs/gal or	, ° API	Trade Nam Producer	e <u>UNH</u> FERMCO	
	b)	Temperature of st (If temperature i	ored material	 l: Average	AMB_ °F and M	aximum <u>AM</u>	
	c)	Vapor pressure of is not known, wri			e i, ii, iii o	f this ite	m. If vapor pressur
		i.) Actual va	por pressure:				storage temperature storage temperature
		ii.) Reid vapo	r pressure:	Average <u>unl</u>	kn psi and mir	nimum-maxir	num <u>unkn</u> - <u></u> ps
			al stored is : <u>N/A</u> psi			rovide the	pressure at which i
A	d)	Type of liquid orgasoline, fuel oithe question below	l, kerosene,				quid <u>other</u> than a leum liquid, answer
		Is it a photoch	emically reac	tive materi	al? [] Yes	[ ] N	0
	e)	Type of waste mate	erial (If the	material i	s a waste, ansv	wer the qu	estion below.)
		Is it a hazardo If yes, identify	us waste? [ y type (EPA h	] yes [X azardous wa	No ste number)	<u> </u>	
	f)	Indicate the year	(or 12-mont	h period) fo	or item (g): _	1-1	-94 to 12-31-94
	g)	Annual throughput	of material:		150,000	gallons.	
_							09-16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6 x  $10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the LANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

Tank Characteristics Identification				
Identification No.: State:	T029 Ohio	City: Company:	Dayton DOE_FEMP	
Input Parameters Type of Tank:	Vertical Fixe	d Roof		
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	16 3 29	Diameter (ft): Volume (gallons): Net Throughput (gal/yr)	17 5094 : 150000	
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Height (ft): Dome Radius (ft):	0.000 0.00	
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Aluminum/Spec Aluminum/Spec		Good Good	
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00	

```
---- Storage Tank Contents Temperature Data ----
 Daily Average Ambient Temperature (Degrees Fahrenheit) =
                                                                  51.90
 Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                  42.30
 Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                  61.50
 Daily Ambient Temperature Range =
                                                                  19.20
 Solar Insolation Factor =
                                                                1160.00
 Alpha (Shell) =
                                                                   0.39
 Alpha (Roof) =
                                                                   0.39
 Liquid Bulk Temperature (Degrees Fahrenheit) =
                                                                  53.24
 Average Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                  56.22
 Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) = 62.84
 Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) = 49.60
 Daily Vapor Temperature Range =
                                                                  26.49
 --- Storage Tank Vapor Pressure Information ----
 Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                               0.227238
Minimum Vapor Pressure of total mixture =
                                               0.175816
Maximum Vapor Pressure of total mixture =
                                               0.287205
Vapor Molecular Weight of Mixture =
                                              18.000000
Vapor pressure range =
                                               0.111389
--- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                     0.00
Vapor Space Outage =
                                     13.00
Vapor Space Volume =
                                  2950.74
Vapor Density =
                                   0.0007
Breather Vent Range =
                                 0.000000
Vapor Space Expansion Factor =
                                 0.044914
Vented Vapor Saturation Factor = 0.864628
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                150000
Liquid Volume (cubic feet) =
                                   681
Turnovers =
                                    29
Turnover Factor =
                                1.0000
Working Loss Product Factor
                                 1.00
Total Working Losses =
                                 14.61
--- Storage Tank Total Losses (AP-42) ----
Total losses = 45.51
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions:  $\frac{45.51 \text{ lb water } | 6 \times 10^{-06} \text{ lb U } |}{\text{year}} = 2.73 \text{ E-07 lb U/year}$ 

Maximum Emissions: 2.73 E-07 lb U/year x 5 = 1.37 E-06 lb U/year

# 1 4493

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

	Fernald Envir		anagement roject	Mr. Stephen Person to Co	
	Willey Road ity Address			Post Office I	
<u>Ferna</u> City		on unty	45030 Zip	<u>Cincinnati</u> City	OH 45239-8705 State Zip
Telepi	hone	513/ 738- Area	6502 Number	Telephone	513/ 738-6502
(Appl	ication no., if	#143111012 this is a		ication)	4953 Std. Ind. Class. Code
1.	Complete and a air contaminan be attached wh	t source.	In addition,	a compliance	most appropriate to the time schedule form is to the following:
	Appendix A, Appendix B, Appendix C, Appendix D,	Fuel-Burn Incinerat	oating or		L, Solvent Metal Cleaning M, Fugitive Dust Emission Sources
. /	XX_Appendix E, Appendix H, Appendix J,	Storage T Gasoline Facility Loading R Gasoline	ank Dispensing ack at Bulk	Appendix	Specify Appendix No. N, Rubber Tire Manufacturing O, Dry Cleaning Facility
	Appendix K,		oating rinting Line	Other Appe	P, Landfills endix e Time Schedule
2.	Description of	Source (sa	ame as used on	appendix):	JNH Storage Tank F2E-7
3.	Your identific Plant 2	ation for S /3 UNH Stor	Source (same a rage Tank F2E-	s used on appo 7, FEMP Id. #	endix): 2-027
	Administrative contaminant so	Code, hereurce(s) des	eby apply for scribed herein	a Permit to O . As require	2(B) of the Ohio perate the air d, the following pplication (describe all
	<ul><li>(1) Appendix E</li><li>(2) Emissions</li></ul>			Authorized 3 Kenneth L. A Vice Preside Title	
				Date O	0c+93

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

FOR OFFICIAL USE ONLY

Premise No.	////
Source No	/
Application	No/_

DOE - FEMP (Facility Name)

## APPENDIX E-2

## INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1.	Tank identification: Name or number <u>UNH Storage Tank F2E-7</u> Date Installed <u>1952</u> (month/year)
2.	Tank capacity: 25,265 gallons
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify
4.	Tank dimensions: Diameter <u>16.5 ft.</u> Height <u>16 ft.</u> Length <u></u> Width <u></u>
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ X] Other, specify Tank is insulated
7.	Location of tank: [X] Outdoors [] Indoors [] Underground
8.	Type of filling: [X] Splash [ ] Submerged [ ] Other, specify
9.	If this tank is located outdoors and above ground, provide the paint color of the tank.
	[ ] Aluminum (specular) [ ] Light gray [ ] White [X] Other, specify Black Insulation covering condition of paint: [X] Good [ ] Poor is painted.
10.	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
N/A	a) Type of vapor control system
	Manufacturer Make or model Date installed (month and year)
	b) Date tank was equipped with or vented to vapor control system (month & year)
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:
	(Attach calculations and test data to support response, unless previously submitted.)

N/A			Pressure	Vacuum		pressure relief is discharged to
	Typ	oe of Vent Valve	<u>Setting</u>	<u>Setting</u>	<u>vapor (</u>	control, identify the vapor cont
	_		· · · · · · · · · · · · · · · · · · ·			
		1 Data /			46.50.540	Courabbasiale stead on to
12.		erational Data (com ored. Attach addit				m for all materials stored or to
	a)	Material <u>Urany</u> Density: <u>10.8</u>	<u>l Nitrate</u> _ lbs/gal or			e Name <u>UNH</u> er <u>FERMCO</u>
	b)	Temperature of st (If temperature i	ored materia s approximato	l: Average	<u>AMB</u> °F a	and Maximum <u>AMB</u> ° F emperature, write "AMB".)
	c)	Vapor pressure of is not known, wri			e i, ii,	iii of this item. If vapor press
		i.) Actual va	por pressure:			sia at average storage temperatu sia at maximum storage temperatu
		ii.) Keid vapo	r pressure:	Average <u>unk</u>	<u>kn</u> psi an	d minimum-maximum <u>unkn</u> - <u></u>
			al stored is : <u>N/A</u> psi			s, provide the pressure at which
N/A	d)	Type of liquid or gasoline, fuel oi the question below	ĺ, kerosene,	ll (If the macrude oil, l	aterial is lubricant	an organic liquid <u>other</u> than a or other petroleum liquid, answ
		Is it a photoch	emically read	tive materia	11? []	Yes [ ] No
- •	e)	Type of waste mate	erial (If the	material is	a waste,	answer the question below.)
		Is it a hazardo If yes, identif	us waste? [ y type (EPA h	] yes [X] azardous was		·)
	f)	Indicate the year	(or 12-mont	h period) fo	r item (g	): <u>1-1-94 to 12-31-94</u>
	g)	Annual throughput	of material:		150,000	gallons.
Comple	eted	by <u>Kip Klee</u>				Date09-16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6 x  $10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

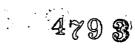
Tank Characteristics Identification Identification No.: State:	T030 Ohio	City: Company:	Dayton DOE-FEMP
Input Parameters Type of Tank:	Vertical Fix	ed Roof	
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	16 3 29	Diameter (ft): Volume (gallons): Net Throughput (gal/yr)	17 5094 : 150000
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Height (ft): Dome Radius (ft):	0.000
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Red/Primer Red/Primer	Shell Condition: Roof Condition:	Good Good
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00

```
---- Storage Tank Contents Temperature Data ----
Daily Average Ambient Temperature (Degrees Fahrenheit) = Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                    51.90
                                                                    42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                    61.50
Daily Ambient Temperature Range =
                                                                    19.20
Solar Insolation Factor =
                                                                  1160.00
Alpha (Shell) =
                                                                     0.89
Alpha (Roof) =
                                                                     0.89
Liquid Bulk Temperature (Degrees Fahrenheit) =
                                                                    56.24
                                                                    62.49
Average Liquid Surface Temperature (Degrees Fahrenheit) =
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                    73.17
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                    51.81
                                                                    42.73
Daily Vapor Temperature Range =
--- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                                0.283469
Minimum Vapor Pressure of total mixture =
                                                0.192377
Maximum Vapor Pressure of total mixture =
                                                0.409037
Vapor Molecular Weight of Mixture =
                                              18.000000
Vapor pressure range =
                                                0.216660
---- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                      0.00
Vapor Space Outage =
                                     13.00
Vapor Space Volume =
                               2950.74
Vapor Density =
                                    0.0009
Breather Vent Range =
                                  0.000000
Vapor Space Expansion Factor = 0.051799
Vented Vapor Saturation Factor = 0.836603
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                150000
Liquid Volume (cubic feet) =
                                    681
                                     29
Turnovers =
Turnover Factor =
                                 1.0000
Working Loss Product Factor =
                                  1.00
Total Working Losses =
                                  18.22
--- Storage Tank Total Losses (AP-42) ----
Total losses = 60.72
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Maximum Emissions: 3.64 E-07 lb U/year x 5 = 1.82 E-06 lb U/year

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE



	Fernald Envir		agement ject	Mr. Stephen M Person to Con		
7400	Willey Road ity Address	·		Post Office Bo Mailing Addre	ox 398704	
<u>Ferna</u> City		on 4 unty	1 <u>5030</u> Zip	<u>Cincinnati</u> City		9 <u>-8705</u> Zip
Telep		<u>513/ 738-65</u> Area N	02 umber	Telephone	513/ 738-65	502
	ication no., if		enewal appli	•	4953 Std. Ind. Clas	
1.	air contaminante be attached who attached who attached who appendix A, Appendix B, Appendix D, Appendix E, Appendix H, Appendix J, Appendix J, Appendix K,	t source. In en applicable Process Fuel-Burning Incinerator Surface Coar Printing Operators of Storage Tank Gasoline Districtly Loading Rack Gasoline Plate Terminal Surface Coar Line or Printing Coard Coa	n addition, e. Check as  g Equipment  ting or eration k spensing k at Bulk ant or  ting nting Line	a compliance t appropriate tAppendix MAppendix MAppendix NAppendix OAppendix OAppendix POther Appendix Compliance	Solvent Meta Cleaning I, Fugitive Dus Emission Sou Specify Appe I, Rubber Tire Manufacturin O, Dry Cleaning Facility I, Landfills Indix Time Schedule	orm is to  1 t rces ndix No.
2.	Your identification of Your identification Plant 2, I, being the in Administrative contaminant sou additional documents):  (1) Appendix E-(2) Emissions E	ation for Sou /3 UNH Storace  ndividual specification  Code, hereby  urce(s) description  iments are success.	urce (same as ge Tank F2E-5 ecified in Ro y apply for a ribed herein	s used on apper 5, FEMP Id. # 3 ule 3745-35-02 a Permit to Op . As required art of this ap Authorized Si Kenneth L. Al	ndix): 2-028  (B) of the Ohioerate the air the following oplication (designature)	o g cribe all

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate of prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

Prem Sour Appl	ise No//
	APPENDIX E-2
	INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS
1.	Tank identification: Name or number <u>UNH Storage Tank F2E-5</u> Date Installed <u>1952</u> (month/year
2.	Tank capacity: 25,265 gallons
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify
4.	Tank dimensions: Diameter 16.5 ft. Height 16 ft. Length Width
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Stee
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [ [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ ] Other, specify
7.	Location of tank: [X] Outdoors [ ] Indoors [ ] Underground
8.	Type of filling: [X] Splash [ ] Submerged [ ] Other, specify
9. N/A	If this tank is located outdoors and above ground, provide the paint color of the tank.  Tank is stainless steel, not painted  [ ] Aluminum (specular) [ ] Light gray [ ] White  [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify
	Condition of paint: [ ] Good [ ] Poor
10. N/A	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
.,,	a) Type of vapor control system Manufacturer Make or model Date installed (month and year)
	b) Date tank was equipped with or vented to vapor control system (month & year)
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:

(Attach calculations and test data to support response, unless previously submitted

4793
DOE - FEMP
(Facility Name)
F2E-5 (2-028)
(tank identification)

1. N/A	Con	nplete the table be	low for any	pressure or	vacuum relief vent	valve.
11/7	Typ	oe of Vent Valve	Pressure <u>Setting</u>	Vacuum Setting	If pressure vapor control, i	relief is discharged to a dentify the vapor control
2.		erational Data (compored. Attach addit				materials stored or to be
	a)	Material Urany Density: 23.3	<u>  Nitrate</u> _ lbs/gal or		Trade Name <u> </u> Producer <u>FER</u> 1	
	b)	Temperature of sto (If temperature is			<u>AMB</u> °F and Maximo ambient temperature	
	c)	Vapor pressure of is not known, writ			e i, ii, iii of thi	s item. If vapor pressur
		i.) Actual var	oor pressure			erage storage temperature cimum storage temperature
		ii.) Reid vapor	pressure:	Average <u>unk</u>	<u>kn</u> psi and minimum	-maximum <u>unkn</u> ps
				a gas or lic i gage at <u>l</u>		e the pressure at which i
N/A	d)	Type of liquid org gasoline, fuel oil the question below	, kerosene,	al (If the ma	aterial is an orgar lubricant or other	ic liquid <u>other</u> than a petroleum liquid, answer
	1	Is it a photoche	mically read	ctive materia	al? [] Yes [	] No
	e)	Type of waste mate	rial (If the	e material is	s a waste, answer t	he question below.)
		Is it a hazardou If yes, identify				
	f)	Indicate the year	(or 12-mont	h period) fo	r item (g):	1-1-94 to 12-31-94
	g)	Annual throughput	of material:	·	150,000 gall	ons.
omple	ted	by <u>Kip Klee</u>	·		Date	09-16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be  $6 \times 10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

Tank Characteristics Identification				
Identification No.: State:	T031 Ohio	City: Compan	y:	Dayton DOE-FEMP
Input Parameters Type of Tank:	Vertical F	ixed Roof		
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	16 3 29	Volume	er (ft): (gallons): roughput (gal/yr)	17 5094 : 150000
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000		Height (ft): Radius (ft):	0.000 0.00
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Aluminum/S Aluminum/S		Shell Condition: Roof Condition:	Good Good
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressu	re Setting(psig):	0.00

```
---- Storage Tank Contents Temperature Data ----
Daily Average Ambient Temperature (Degrees Fahrenheit) =
                                                                  51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                  42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                  61.50
                                                                  19.20
Daily Ambient Temperature Range =
                                                                1160.00
Solar Insolation Factor =
                                                                   0.39
Alpha (Shell) =
                                                                   0.39
Alpha (Roof) =
                                                                  53.24
Liquid Bulk Temperature (Degrees Fahrenheit) =
Average Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                  56.22
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                  62.84
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) = 49.60
Daily Vapor Temperature Range =
                                                                  26.49
--- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
                                               0.227238
Vapor Pressure of total mixture =
Minimum Vapor Pressure of total mixture =
                                              0.175816
Maximum Vapor Pressure of total mixture =
                                              0.287205
Vapor Molecular Weight of Mixture =
                                              18.000000
                                              0.111389
Vapor pressure range =
--- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                     0.00
                                     13.00
Vapor Space Outage =
Vapor Space Volume =
                                   2950.74
Vapor Density =
                                   0.0007
Breather Vent Range =
                                 0.000000
Vapor Space Expansion Factor =
                                 0.044914
Vented Vapor Saturation Factor = 0.864628
                                    30.90
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                150000
Liquid Volume (cubic feet) =
                                   681
                                    29
Turnovers =
                                1.0000
Turnover Factor =
Working Loss Product Factor =
                                 1.00
Total Working Losses =
                                 14.61
--- Storage Tank Total Losses (AP-42) ----
Total losses = 45.51
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Maximum Emissions: 2.73 E-07 lb U/year x 5 = 1.37 E-06 lb U/year

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

	Fernald Envi			Mr. Stephen	
Facil	ity Name	<u> </u>	Project	Person to Co	ontact
	Willey Road			Post Office	
Facil	ity Address			Mailing Addr	^ess
<u>Ferna</u>			45030	<u>Cincinnati</u>	OH 45239-8705
City	C	ounty	Zip	City	State Zip
		513/ 738-	-6502		513/ 738-6502
Telep	hone	Area	Number	Telephone	
		#143111012	28-T032		4953
(Appl	ication no., i	f this is a	a renewal appl	ication)	Std. Ind. Class. Code
1.	air contamina	nt source.	In addition,	a compliance	most appropriate to the time schedule form is to the following:
	Appendix A	, Process		Appendix	L, Solvent Metal
	Appendix B	, Fuel-Burr	ing Equipment		Cleaning
	Appendix C Appendix D	, Surface C	Coating or	Appendix	M, Fugitive Dust Emission Sources
	VV Annondiy E	Printing	Operation		Specify Appendix No.
	XX_Appendix E, Storage Tank Appendix H, Gasoline Dispensing			Appendix N, Rubber Tire	
	Appendix ii	Facility	D13pcli3 mg	Арренатх	Manufacturing
	Appendix J	, Loading R	lack at Bulk	Appendix	O, Dry Cleaning
		Gasoline	Plant or	<b>.</b>	Facility
	Appendix K	Terminal	oating	Appendix Other Appe	P, Landfills
	Appendix K		rinting Line		e Time Schedule
2.	Description o	f Source (s	ame as used on	appendix):	JNH Storage Tank F2E-8
3.	Your identific	cation for	Source (same a	s used on appe	endix):
	Plant 2	<u>2/3 UNH Sto</u>	rage Tank F2E-	8, FEMP Id. #	2-029
	Administrative contaminant so	e Code, her ource(s) de	eby apply for scribed herein	a Permit to O n. As require	2(B) of the Ohio perate the air d, the following pplication (describe all
	<ul><li>(1) Appendix 6</li><li>(2) Emissions</li></ul>			Authorized S	ignatura
	(2) LIII 133 10 113	LStillate		Kenneth L. A	lkema
9				Vice Preside	nt Regulatory Programs
1#				Title	169
				Date	15
				Date ´	

Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

47	9 3
----	-----

Premise No	/	/_	/
Source No	_/		
Annlication N		1	

DOE - FEMP (Facility Name)

## APPENDIX E-2

### INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1.	Tank identification: Name or number <u>UNH Storage Tank F2E-8</u> Date Installed <u>1952</u> (FEMP Id. # 2-029) (month/year)
2.	Tank capacity: 25,265 gallons
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify
4.	Tank dimensions: Diameter 16.5 ft. Height 16 ft. Length Width
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ X] Other, specify Tank is insulated
7.	Location of tank: [X] Outdoors [] Indoors [] Underground
8.	Type of filling: [X] Splash [] Submerged [] Other, specify
9.	If this tank is located outdoors and above ground, provide the paint color of the tank.
	[ ] Aluminum (specular) [ ] Light gray [ ] White [ ] Aluminum (diffuse) [ ] Medium gray [X] Other, specify Black Insulation covering is painted.
10.	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
N/A	a) Type of vapor control system Make or model Date installed (month and year)
	b) Date tank was equipped with or vented to vapor control system (month & year)
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:  (Attach calculations and test data to support response, unless previously submitted.)

DOE - FEMP'
(Facility Name)
F2E-8 (2-029)
(tank identification)

11. N/A	Cor	Complete the table below for any pressure or vacuum relief vent valve.					
N/A	Ţyŗ	oe of Vent Valve	Pressure <u>Setting</u>	Vacuum <u>Setting</u>		elief is discharged to entify the vapor contr	
12.	Ope sto	erational Data (com ored. Attach addit	plete (a) th ional sheets	rough (g) of if necessar	this item for all m	naterials stored or to	
	a)	Material <u>Urany</u> Density: <u>9.0</u>	l Nitrate lbs/gal or	° API	Trade Name <u>UN</u> Producer <u>FERM</u> O		
	b)	Temperature of st	ored materia	1: Average	AMB °F and Maximum ambient temperature,	<u>AMB</u> ° F write "AMB".)	
	c)	Vapor pressure of is not known, wri			e i, ii, iii of this	item. If vapor press	
		i.) Actual va	por pressure		).28 psia at aver ).41 psia at maxi	age storage temperatur mum storage temperatur	
		ii.) Reid vapor	r pressure:	Average <u>unk</u>	n psi and minimum-	maximum <u>unkn</u>	
	•		al stored is:N/Apsi			the pressure at which	
N/A	d)	Type of liquid org gasoline, fuel oi the question below	l, kerosene,	al (If the macrude oil, l	terial is an organi ubricant or other p	c liquid <u>other</u> than a etroleum liquid, answe	
		Is it a photoche	emically read	ctive materia	1? [] Yes [	] No	
	e)	Type of waste mate	erial (If the	e material is	a waste, answer th	e question below.)	
		Is it a hazardou If yes, identify	ıs waste? [ / type (EPA h	] yes [X] nazardous was			
	f)	Indicate the year	(or 12-mont	h period) fo	r item (g):	1-1-94 to 12-31-94	
	g)	Annual throughput	of material:		150,000 gallo	ns.	
Comple	eted	by <u>Kip Klee</u>	<del></del>		Date _	09-16-93	

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Uranyl Nitrate solution is equal to that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6 x  $10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

Tank Characteristics Identification Identification No.:	T032	City:	Dayton
State:	Ohio	Company:	DOE-FEMP
Input Parameters Type of Tank:	Vertical Fix	ed Roof	
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	16 3 29	Diameter (ft): Volume (gallons): Net Throughput (gal/yr)	17 5094 : 150000
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Height (ft): Dome Radius (ft):	0.000
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Red/Primer Red/Primer	Shell Condition: Roof Condition:	Good Good
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00

```
---- Storage Tank Contents Temperature Data ----
 Daily Average Ambient Temperature (Degrees Fahrenheit) =
                                                                   51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                   42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                   61.50
Daily Ambient Temperature Range =
                                                                   19.20
Solar Insolation Factor =
                                                                 1160.00
Alpha (Shell) = Alpha (Roof) =
                                                                    0.89
                                                                    0.89
Liquid Bulk Temperature (Degrees Fahrenheit) =
                                                                   56.24
                                                                   62.49
Average Liquid Surface Temperature (Degrees Fahrenheit) =
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                   73.17
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                   51.81
                                                                   42.73
Daily Vapor Temperature Range =
---- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                               0.283469
Minimum Vapor Pressure of total mixture =
                                               0.192377
Maximum Vapor Pressure of total mixture =
                                               0.409037
Vapor Molecular Weight of Mixture =
                                              18.000000
Vapor pressure range =
                                               0.216660
--- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                      0.00
Vapor Space Outage =
                                     13.00
Vapor Space Volume =
                                   2950.74
Vapor Density =
                                    0.0009
Breather Vent Range =
                                  0.000000
Vapor Space Expansion Factor =
                                  0.051799
Vented Vapor Saturation Factor = 0.836603
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                 150000
Liquid Volume (cubic feet) =
                                    681
Turnovers =
                                     29
Turnover Factor =
                                 1.0000
Working Loss Product Factor =
                                  1.00
Total Working Losses =
                                  18.22
--- Storage Tank Total Losses (AP-42) ----
Total losses = 60.72
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Maximum Emissions: 3.64 E-07 lb U/year x 5  $\approx$  1.82 E-06 lb U/year

¥€ ₫ξ - 002**6** 

# OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

4793

<u>D.O.E</u>	Fernald Envir			Mr. Stephen	M. Beckman
Facil	ity Name	<u> </u>	<u>roject</u>	Person to Co	ontact
	Willey Road			Post Office F	
Facil	ity Address			Mailing Addr	`ess
<u>Ferna</u>	<u>ld Hamilt</u>	on	45030	Cincinnati	OH 45239-8705
City	Co	unty	Zip	City	State Zip
		513/ 738-0	5502		513/ 738-6502
Telep	hone	Area	Number	Telephone	
		#143111012	B-T033		4953
(Appl	ication no., if	this is a	renewal appl	ication)	Std. Ind. Class. Code
1.	Complete and a air contaminan be attached wh	t source.	In addition,	a compliance	most appropriate to the time schedule form is to the following:
	Appendix A, Appendix B, Appendix C, Appendix D,	Fuel-Burn	oating or	<del></del>	L, Solvent Metal Cleaning M, Fugitive Dust Emission Sources
	XX_Appendix E,Appendix H,Appendix J,	Gasoline Description Research	Dispensing ack at Bulk	Appendix	Specify Appendix No. N, Rubber Tire Manufacturing O, Dry Cleaning Facility
	Appendix K,		eating Finting Line	Other Appe	P, Landfills endixe E Time Schedule
2.	$\hbox{\tt Description of}$	Source (sa	me as used on	appendix):	Storage Tank F1-25A
3.	Your identifica Plant 2			s used on appe k F1-25A, FEMF	
	Administrative contaminant sou	Code, here urce(s) des uments are	by apply for cribed herein	a Permit to Open. As required part of this a Authorized Standard Kenneth L. A	d, the following pplication (describe all land)
			•	Date	1 47

\*Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1 EPA-3161

0027

FOR OFFICIAL USE ONLY

	· · · · · · · · · · · · · · · · · · ·
Prei Soui App	mise No//
• • •	APPENDIX E-2
	INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS
1.	Tank identification: Name or number <u>Slopwater St. tank Fl-25A</u> Date Installed <u>1952</u> (FEMP Id. # 2-030) (month/ye
2.	Tank capacity: 14,203 gallons
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify
4.	Tank dimensions: Diameter <u>13.25 ft.</u> Height <u>14 ft.</u> Length <u></u> Width <u></u>
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify <u>Stainless Stee</u>
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ ] Other, specify
7.	Location of tank: [X] Outdoors [] Indoors [] Underground
8.	Type of filling: [X] Splash [] Submerged [] Other, specify
9. N/A	If this tank is located outdoors and above ground, provide the paint color of the tank.  Tank is stainless steel, not painted  [ ] Aluminum (specular) [ ] Light gray [ ] White   [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify
	Condition of paint: [ ] Good [ ] Poor
10. N/A	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.
	a) Type of vapor control system Manufacturer Make or model Date installed (month and year)
	b) Date tank was equipped with or vented to vapor control system (month & year)
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:  (Attach calculations and test data to support response, unless previously submitted.

DAE FEME 9 3
(Facility Name)
<u>F1-25A</u> (2-030) _
(tank identification)

11. N/A	Con	Complete the table below for any pressure or vacuum relief vent valve.					
Ν/Α	<u>Tyr</u>	e of Vent Valve	Pressure Setting	Vacuum <u>Setting</u>			s discharged to a the vapor control.
		· · · · · · · · · · · · · · · · · · ·	·				
			7				
12.		rational Data (com red. Attach addit				ali materia	is stored or to be
	a)	Material Slopwater Density: 8.3	r, Rainwater _ lbs/gal or	process wat	ter Trade Name Producer	FERMCO	
	<b>b)</b>	Temperature of sto (If temperature is					
	c)	Vapor pressure of is not known, writ			e i, ii, iii of	f this item.	If vapor pressure
		i.) Actual vap	oor pressure:				orage temperature orage temperature
		ii.) Reid vapor	r pressure:	Average <u>unk</u>	<u>m</u> psi and min	imum-maximu	m <u>unkn</u> - <u></u> psi
			al stored is : <u>N/A</u> psi			ovide the p	ressure at which it
N/A	d)	Type of liquid org gasoline, fuel oil the question below	, kerosene,				
		Is it a photoche	emically reac	tive materia	1? [] Yes	[ ] No	
	e)	Type of waste mate	erial (If the	material is	a waste, answ	er the ques	tion below.)
		Is it a hazardou If yes, identify	ıs waste? [ v type (EPA h	] yes [X] azardous was	No te number)		
	f)	Indicate the year	(or 12-mont	h period) fo	r item (g): _	1-1-9	94 to 12-31-94
	g)	Annual throughput	of material:	2,	500,000	gallons.	
Comple	ted	by <u>Kip Klee</u>	· · · · · · · · · · · · · · · · · ·		[	Date	09-16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Slopwater solution is essentially that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be 6 x  $10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

Tank Characteristic Identification		City.	Dayton	
Identification No.: State:	T033 Ohio	City: Company:	Dayton DOE-FEMP	
Input Parameters Type of Tank:	Vertical	Fixed Roof		
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	1	5 Diameter (ft 5 Volume (gall 3 Net Throughp	ons): 14895	5
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Heigh Dome Radiu		
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Aluminum/S		Condition: Goo Condition: Goo	
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(	psig): 0.00	

```
---- Storage Tank Contents Temperature Data ----
Daily Average Ambient Temperature (Degrees Fahrenheit) = Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                     51.90
                                                                     42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                     61.50
                                                                     19.20
Daily Ambient Temperature Range =
Solar Insolation Factor =
                                                                   1160.00
                                                                      0.39
Alpha (Shell) =
                                                                      0.39
Alpha (Roof) =
                                                                     53.24
Liquid Bulk Temperature (Degrees Fahrenheit) =
Average Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                     56.22
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                     62.84
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                     49.60
                                                                     26.49
Daily Vapor Temperature Range =
--- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                                0.227238
Minimum Vapor Pressure of total mixture =
                                                0.175816
Maximum Vapor Pressure of total mixture =
                                                0.287205
Vapor Molecular Weight of Mixture =
                                               18.000000
Vapor pressure range =
                                                0.111389
--- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                       0.00
Vapor Space Outage =
                                       0.00
Vapor Space Volume =
                                       0.00
Vapor Density =
                                     0.0007
Breather Vent Range =
                                   0.000000
Vapor Space Expansion Factor =
                                   0.044914
Vented Vapor Saturation Factor = 1.000000
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                  2500000
Liquid Volume (cubic feet) =
                                     1991
Turnovers =
                                      168
Turnover Factor =
                                   0.3454
Working Loss Product Factor =
                                    1.00
Total Working Losses =
                                    84.10
--- Storage Tank Total Losses (AP-42) ----
Total losses = 84.10
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Maximum Emissions: 5.05 E-06 lb U/year x 5 = 2.52 E-05 lb U/year

0.031

### OHIO ENVIRONMENTAL PROTECTION AGENCY APPLICATION FOR A PERMIT TO OPERATE AN AIR CONTAMINANT SOURCE

	Fernald Env			Mr. Stephen N	1. Beckman
Facil	ity Name		<u>Project</u>	Person to Co	ntact
	Willey Road ity Address			Post Office B Mailing Addr	ox 398704
racii	ity Address			matting Addr	
Ferna		<u>Iton</u> County	45030	<u>Cincinnati</u> City	OH 45239-8705 State Zip
City		County	Zip	City	State Zip
<del></del>	1	513/ 738		7.1	513/ 738-6502
Telep	none	Area	Number	Telephone	
	<del> </del>	#14311101			4953
(App1	ication no.,	if this is	a renewal appl	ication)	Std. Ind. Class. Code
1.	air contamin	ant source.	In addition,	ving appendices a compliance t as appropriate t	most appropriate to the time schedule form is to the following:
	Appendix /	A, Process		Appendix L	., Solvent Metal
	Appendix	B, Fuel-Bura C, Incinera	ning Equipment		Cleaning
		c, Incinera D, Surface (		Appendix r	1, Fugitive Dust Emission Sources
		Printing	Operation		
	XX_Appendix   Appendix	E, Storage	Tank Dispensing	Annendiy N	Specify Appendix No. I, Rubber Tire
	Appendix i	Facility	D 13 pens mg		Manufacturing
	Appendix \		Rack at Bulk	Appendix 0	, Dry Cleaning
		Gasoline Terminal	Plant or	Annendix P	Facility , Landfills
	Appendix k	K, Surface (		Other Appe	ndix
		Line or f	Printing Line	Compliance	Time Schedule
2.	Description o	of Source (s	ame as used or	n appendix):	Storage Tank F1-26A
3.				as used on appe nk Fl-26A, FEMP	
	Administrative contaminant s	ve Code, her source(s) de ocuments are	reby apply for escribed herei	a Permit to Op n. As required	(B) of the Ohio erate the air , the following plication (describe all
	(1) Appendix	E-2		- A MALLA	/h-llllll
	(2) Emissions			Authorized Si	
				Kenneth L. Al	kema t <u>Requlatory Programs</u>
				Title	/ negatatory reagrams
	•			<b>M</b> M	93
				Date	

Pursuant to OAC Rule 3745-35-02(B) (Permit to Operate).

Operation of an air contaminant source without an effective permit to operate is prohibited to 3704.05 Ohio Revised Code. Page 1  $$\tt EPA-3161$$ 

Premise No///	
Source No/	
Application No/	

	DOE	- FE	MP
(F	acil	ity	Name)

### APPENDIX E-2

# INORGANIC MATERIAL STORAGE TANK OR STORAGE TANK WITH CAPACITY LESS THAN 40,000 GALLONS

1.	Tank identification: Name or number <u>Slopwater St. tank F1-26A</u> Date Installed <u>1952</u> (FEMP Id. # 2-031) (month/year)				
2.	Tank capacity: 14,203 gallons				
3.	Tank shape: [X] Cylindrical [ ] Rectangular [ ] Other, specify				
4.	Tank dimensions: Diameter 13.25 ft. Height 14 ft. Length Width				
5.	Tank shell material: [ ] Steel [ ] Aluminum [X] Other, specify Stainless Steel				
6.	Type of tank:  [ ] External floating roof tank [ ] Internal floating roof tank [X] Fixed roof tank [ ] Vertical cylindrical tank [ ] Horizontal cylindrical tank [ ] Pressure tank [ ] Other, specify				
7.	Location of tank: [X] Outdoors [] Indoors [] Underground				
8.	Type of filling: [X] Splash [ ] Submerged [ ] Other, specify				
	If this tank is located outdoors and above ground, provide the paint color of the tank.  Tank is stainless steel, not painted  [ ] Aluminum (specular) [ ] Light gray [ ] White  [ ] Aluminum (diffuse) [ ] Medium gray [ ] Other, specify				
	Condition of paint: [ ] Good [ ] Poor				
10. N/A	If this tank is equipped with or vented to a vapor control system, complete (a) through (c) of this item.				
	a) Type of vapor control system Make or model Date installed (month and year)				
	b) Date tank was equipped with or vented to vapor control system (month & year)				
	c) Specify the rate of emission or percent control (by weight) for any pollutants being controlled:  (Attach calculations and test data to support response, unless previously submitted.)				

DOE - FEMP (Facility Name) F1-26A (2-031) (tank identification)

N/A	Tyr	oe of Vent Valve	Pressure <u>Setting</u>	Vacuum Setting	If pressu vapor contro	ure relief is only in the second of the seco	discharged to e vapor cont
12.		erational Data (com ored. Attach addit				all materials	stored or to
	a)	Material Slopwate Density: 8.3	r. Rainwater _ lbs/gal or	. process wat API	<u>er</u> Trade Name Producer	FERMCO	
	b)	Temperature of st (If temperature i	ored materia s approximato	l: Average _ ely outdoor a	<u>AMB</u> °F and Ma mbient tempera	aximum <u>AMB</u> o ture, write "A	F MMB".)
	c)	Vapor pressure of is not known, wri			i, ii, iii of	this item. I	f vapor pres
		i.) Actual va	por pressure			average stora maximum stora	
		ii.) Reid vapo	r pressure:	Average <u>unk</u> ı	1_psi and min	imum-maximum <u></u>	<u>unkn</u>
		iii.) If materi is stored	al stored is: <u>N/A</u> ps:	a gas or liqu i gage at <u>N</u>	uified gas, pro <u>/A</u> °F	ovide the pres	sure at which
N/A	d)	Type of liquid orgasoline, fuel oithe question below	l, kerosene,	al (If the ma crude oil, l	terial is an o ubricant or ot	rganic liquid her petroleum	<u>other</u> than a liquid, answ
		Is it a photoch	emically read	ctive materia	l? [] Yes	[ ] No	
	e)	Type of waste mate	erial (If the	e material is	a waste, answ	er the questio	n below.)
		Is it a hazardo If yes, identif	us waste? [ y type (EPA h	] yes [X] nazardous was	No ce number)		
	f)	Indicate the year	(or 12-mont	h period) for	item (g): _	1-1-94 t	to 12-31-94
	g)	Annual throughput	of material:	2.	500,000	gallons.	
Comple	eted	by <u>Kip Klee</u>				Date09-	16-93

The calculations for uranium emissions are based on known data where possible and where data for parameters is unknown or incomplete, conservative values producing a "worst case" condition for emissions are used.

- (1) At typical tank pressures and temperatures, the vapor pressure of the Slopwater solution is essentially that of water.
- (2) Since uranium does not vaporize at storage conditions the only mechanism for uranium loss from the tank is by entrainment in the aerosol or mist generated during liquid storage and transfer.
- (3) Uranium emissions are determined by multiplying the amount of water lost from the tank by entrainment in the aerosol or mist generated during liquid storage and transfer by an emission factor determined from laboratory tests conducted on Lab sample D-37, Lab #2-9846.
- (4) The emission factor has been determined to be  $6 \times 10^{-06}$  gU/l of solution; the maximum concentration of uranium entrained in the vapor from a boiling solution of 9% uranyl nitrate as determined by the laboratory tests.
- (5) Vapor losses from the tank are calculated using the TANKS software program, version 1.1.
- (6) Maximum emissions are five times the calculated annual emissions.

Tank Characteristics Identification Identification No.: State:	T034 Ohio	City: Company:	Dayton DOE-FEMP
Input Parameters Type of Tank:	Vertical Fix	ed Roof	
Tank Dimensions Shell Height (ft): Liquid Height (ft): Turnovers:	15 15 168	Diameter (ft): Volume (gallons): Net Throughput (gal/yr):	13 14895 : 2500000
Roof Characteristics Roof Type: Slope (ft/ft):	Cone 0.00000	Roof Height (ft): Dome Radius (ft):	0.000 0.00
Paint Characteristics Shell Color/Shade: Roof Color/Shade:	Aluminum/Spec Aluminum/Spec		Good Good
Breather Vent Settings Vacuum Setting(psig):	0.00	Pressure Setting(psig):	0.00 0035

```
--- Storage Tank Contents Temperature Data ----
Daily Average Ambient Temperature (Degrees Fahrenheit) =
                                                                 51.90
Daily Minimum Ambient Temperature (Degrees Fahrenheit) =
                                                                 42.30
Daily Maximum Ambient Temperature (Degrees Fahrenheit) =
                                                                  61.50
Daily Ambient Temperature Range =
                                                                  19.20
Solar Insolation Factor =
                                                                1160.00
                                                                  0.39
Alpha (Shell) =
                                                                  0.39
Alpha (Roof) =
Liquid Bulk Temperature (Degrees Fahrenheit) =
                                                                  53.24
Average Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                 56.22
Daily Maximum Liquid Surface Temperature (Degrees Fahrenheit) =
                                                                 62.84
Daily Minimum Liquid Surface Temperature (Degrees Fahrenheit) = 49.60
Daily Vapor Temperature Range =
--- Storage Tank Vapor Pressure Information ----
Speciation Option: None
Chemical Liquid: Uranyl Nitrate
Vapor Pressure of total mixture =
                                              0.227238
                                              0.175816
Minimum Vapor Pressure of total mixture =
Maximum Vapor Pressure of total mixture =
                                             0.287205
Vapor Molecular Weight of Mixture =
                                             18.000000
                                              0.111389
Vapor pressure range =
--- Storage Tank Standing Loss Information (AP-42) ----
Roof Outage =
                                     0.00
Vapor Space Outage =
                                     0.00
Vapor Space Volume =
                                     0.00
Vapor Density =
                                   0.0007
Breather Vent Range =
                                 0.000000
Vapor Space Expansion Factor = 0.044914
Vented Vapor Saturation Factor = 1.000000
Total Standing Losses =
--- Storage Tank Working Loss Information (AP-42) ----
Net Throughput (gal/year) =
                                2500000
Liquid Volume (cubic feet) =
                                   1991
Turnovers =
                                    168
Turnover Factor =
                                 0.3454
                   Working Loss Product Factor =
                                  1.00
Total Working Losses =
                                  84.10
--- Storage Tank Total Losses (AP-42) ----
Total losses = 84.10
```

These calculations are based on conservative estimates, the actual emissions are expected to be less than those indicated.

Annual Emissions: 84.10 lb water  $|6 \times 10^{-06} |$  b  $|0 \rangle | = 5.05 |$  E-07 lb  $|0 \rangle |$  year  $|0 \rangle |$  | 1000 lb water  $|0 \rangle |$ 

Maximum Emissions: 5.05 E-07 lb U/year x 5 = 2.52 E-06 lb U/year